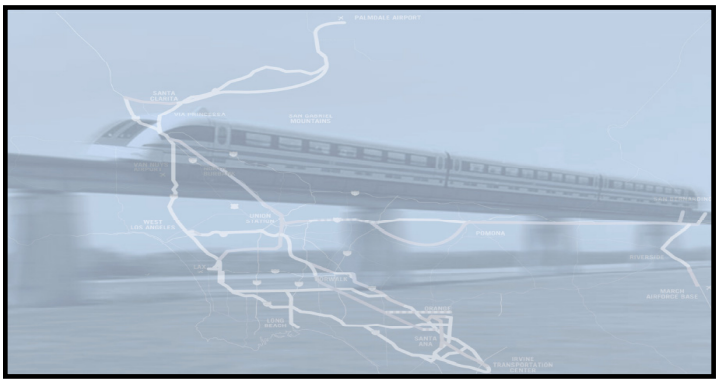
EXECUTIVE SUMMARY

1.1 Introduction



This Milestone Report, the first in a series of seven, provides the Southern California Association of Governments (SCAG) the Phase I MAGLEV project description, baseline schedule, and project initiation documentation. It relates the project overview and schedule, describes the coordination and public outreach plan, and outlines the seven milestone deliverables and the milestone decision-making process that will lead to an Initial Operating Segment (IOS). After the selection of the IOS, Phases II and III will focus on further development of all the required engineering, Public/Private Partnership (PPP), financial and operational deployment tasks required to obtain a Record of Decision (ROD) and DBOM financial resources required to build and operate the first commercially viable MAGLEV System in Southern California.

Phase I was divided into the following milestones:

1. Project Management Plan (PMP).
2. Impact on R.O.W. and Commuter Rail.
3. LAUPT Capacity Study Update.
4. PPP.
5. Refined Financial Analysis.
6. Public Outreach.
7. Technology Transfer.

The objective of Milestone 1 is to create the PMP, which represents the baseline program for Phase I efforts. The PMP defines the timing of individual tasks, staffing, documentation, milestone approval process, schedule, and deliverables for each of the seven milestones.

The Baseline Program, as reflected in this PMP, is based on the proposal submitted and selected by the SCAG dated 4 April 2002. The key sections of the PMP are:

1. Project Overview / Initiation
2. Schedule and Cost Management
3. Document Review and Approval Process
4. Project Milestone Descriptions
5. Milestone Decision-Making Process
6. Agency Coordination Plan
7. Public / Stakeholder Involvement Plan
8. Document Control

1.2 Project Background

The SCAG is planning the development of the future transportation system for the Los Angeles Basin. CommunityLink 21, the Regional Transportation Plan (RTP) adopted by the Regional Council in April 1998, provides a transportation vision to year 2020 along with a framework for future transportation improvement projects. The RTP is a comprehensive plan to achieve mobility, air quality, and other regional goals in the six-county Southern California region (Ventura, Los Angeles, Orange, San Bernardino, Riverside and Imperial counties). Implementing the elements of this landmark RTP will allow the region to meet the stated mobility goals and demonstrate air quality conformity in a financially constrained environment.

A significant component of the RTP is the provision of sufficient capacity to handle regional airport demand. Southern California is a global crossroad between America, Asia, and Europe. A great deal of the economic success of the region is attributable to capitalizing on this. In the future, without expansion, regional airport demand is expected to outpace capacity by a significant margin. By 2020, the passenger capacity shortfall is expected to be one-third of the demand. This is further emphasized by the fact that air cargo is expected to have a capacity shortfall of approximately two-thirds. A likely outcome is a significant loss of economic benefits for the region. The challenge for SCAG, Los Angeles World Airports (LAWA), and the region will be in finding a way to keep pace with air demand to capture the full potential economic benefits of air commerce.

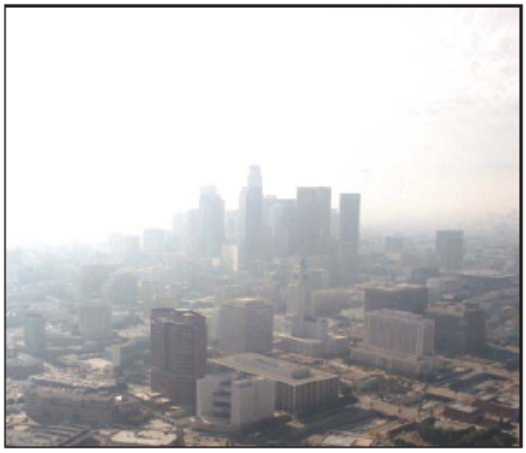
Accommodating the growth in air passenger and air cargo demand will require a multi-faceted approach of judiciously accommodating demand for commercial airports and converting available military bases. SCAG and LAWA are cognizant that the potential adverse impacts of airport expansion require the development of regional strategies and policies to maximize passenger and cargo utilization of outlying airports in less populated areas. The task will be to develop policies that promote outlying airport growth while reducing regional trip making and community impacts. As brought forward in the RTP, a potential solution toward meeting this challenge is the use of high-speed links to connect the airports.

Phase I occurs at a time when a number of other regionally significant studies have been completed. Assessment of the impact and interrelationship of this project to the others will be critical. Other key projects and issues that must be considered include the following:

1. LAX/Palmdale High-Speed Ground Access Study. This project would interface with the LAX/OC system, either directly at LAX or via the East-West MAGLEV through

Union Station. In either case, it would influence both the technology decision and the ultimate ridership of the LAX/OC system by providing high-speed access (either direct or via transfer) to points north of LAX.

2. LAX Master Plan. The degree to which the LAX Master Plan is implemented, which affects the location and number of stations at LAX.



3. California High-Speed Rail Authority Program. The route being contemplated by CHSRA generally follows the LOSSAN corridor and appears to complement the LAX/OC system. However, there are issues of ridership benefits/impacts on both systems, and issues regarding transfers/coordination in Southern Orange County, where the two systems could converge.

4. SCAG Regional Aviation Studies. Ground access studies for airports in the region are currently being conducted by SCAG. To the greatest extent possible, coordination and information from the airport ground access analyses will be incorporated.

5. Anaheim/Ontario Corridor Study. The SCAG is working closely with the AMG to advance the proposed California-Nevada interstate MAGLEV project. The intent of the project is to first construct a Las Vegas to Primm high-speed MAGLEV system that eventually connects to the Southern California MAGLEV network. The Nevada network will integrate with the Southern California line at Barstow, California. The eventual completed corridor is intended to connect Las Vegas to Anaheim; via Barstow, Victorville, and Ontario. The Anaheim to Ontario segment through Corona is currently under study by AMG and represents another SCAG regional expansion option that will increase accessibility and mobility between Orange County and the Ontario Airport. The corridor predominantly follows the Caltrans and Orange County Water District (OCWD) right of way.

6. SCAG Regional Aviation Studies. Ground access studies for airports in the region conducted by SCAG. To the extent possible, coordination and information from the airport ground access analyses will be incorporated.

1.3 Phase I Objectives

It was recognized that the California MAGLEV project required a focused effort to make MAGLEV a reality. Therefore, the objectives of Phase 1 are to:

1. As part of Milestone 2 and 3 tasks, define several Minimum Operating Segments (MOS) from previous studies.
2. Mature the IOS by conducting necessary preliminary-level financial, PPP, and technology transfer work.
3. Provide criteria and data for the selection of the first IOS from the various MOSs.
4. Conduct feasibility assessments of the Right of Way (ROW) and Union Station issues associated with the deployment of a MAGLEV system.
5. Conduct a strategic outreach program.

1.4 Phase I Milestone Description and Schedule

The Phase I MAGLEV Deployment Effort has seven major tasks (milestones). The seven tasks are described in the following paragraphs.

Milestone 1 – PMP. The project has been initiated by establishing management and administrative controls and by developing a strategy to effectively coordinate with agencies, advisory groups, and the public, ensuring all federal processes and requirements will be satisfied. Milestone completion date is December 2002.

Milestone 2 – Analysis of ROW and Commuter Rail Impact. This milestone will build on previous work conducted for the SCAG MAGLEV corridors that have been studied [e.g., LAX – March Global Port, LAX – Palmdale Regional Airport (PMD), LAX – South Orange County, and Orange Line (Los Angeles Union Passenger Terminal (LAUPT) – Anaheim/Santa Ana)]. Half of the focus will be to examine and identify the issues associated with a MAGLEV system overlaid on existing freeway and railroad ROW. The goal is an understood agreement process between the agencies and ourselves. The other half of the focus will be to examine the potential impact of a SCAG MAGLEV system on Southern California Regional Rail Authority (SCRRA) Metrolink ridership. Milestone completion date is June 2003.

Milestone 3 – Update of LAUPT Capacity Study. The focus of this task is to review, assess, and update the 1995 Capacity Study, which consists of three components: pedestrian, rail, and roadway. These components must be examined in the existing and future conditions.

Future condition analysis will examine the effects and impacts of having traditional heavy and light rail, high-speed rail and MAGLEV provided at LAUPT. To the greatest extent possible, the analysis will take into consideration the first years of revenue operations for a MAGLEV line. Milestone completion date is April 2003.

Milestone 4 – Public/Private Partnership (PPP). For the overwhelming majority of transportation projects and services, traditional governmental ownership, operation, and financing will continue to be the norm. For some projects – especially those that are large and complex – a joint venture between the public and private sectors may prove advantageous. State and local governments around the country are turning to joint ventures with private-sector organizations to meet their capital needs. These PPPs have certain advantages, including:

- Production Efficiency. Oftentimes, private firms can build projects faster (if not cheaper), using design-build and other innovative procurement techniques.
- Operating Efficiency. Complex projects may be managed more efficiently, due to greater expertise with innovation and technology, the presence of commercial competition, and the incentive of performance-based compensation.
- Risk Transfer. Private firms may be willing to assume certain risks from the government project sponsor as concerns construction, performance, or demand for the facility. However, the private sector should not be viewed as the ultimate repository for all project risks – only for those exposures of a strictly business nature.
- Access to New Sources of Capital. Private firms may be able to help identify new sources of project revenues that can be monetized. In addition, the private-sector partners may be willing to invest directly in projects or draw upon other funding sources not typically employed in the conventional municipal financing of projects.
- Simplified Project Management. Out-sourcing responsibilities to third-party providers should reduce the government unit's need for staffing up during construction and allow the organization to maintain its institutional focus on current operations.

Our initial Public/Private Partnership action plan will incorporate:

- Team agreements, risk allocation.
- Marketing analysis.
- Due diligence efforts.
- Risk identification and mitigation.
- FRA safety certification ruling process evaluation.
- System design engineering.
- Development of public/private agreements.

- Early program planning and integration/development cost verification.
- Life-cycle cost assessments.
- Ridership studies.
- EIS system engineering support.
- Project budget contractual agreements.

These tasks will be performed between January 2002 and May 2003.

Milestone 5 – Refined Financial Analysis. The LM Team will tailor its spreadsheet-based Financial Analysis Model to the financial planning needs of the study. Overall, the refined Financial Analysis Model will be structured to analyze the timing and cost of capital needs; the operating cost impacts of capital plans; the availability of operating and capital sources; and the need/options for debt financing. It is anticipated that the eventual funding and financing plan to be developed will need to address different rates and different sequences of implementation.

This will reflect the impacts of inevitable constrained future funding. The Financial Analysis Model integrates the projections of expenses and revenues, both capital and operating, and determines the annual operating and capital shortfall and the amount of additional operating funds and capital debt financing required. This model permits rapid analysis of major underlying assumptions, including interest rates, inflation rates, grant matching rates, and dedicated funding sources. Results of the model runs are presented in tabular exhibits which allow the user to evaluate annual cash flows with and without debt financing, sources and uses of funds, bond requirements, and debt service coverage ratios.

The financial analysis will specifically address the following:

- Identification of existing and proposed revenue sources and the development of projections of available funding.
- Assessment of operating and capital shortfalls, including sensitivity testing.
- Evaluation of revenues to close identified funding gaps, including the use of new dedicated funding sources and potential private-sector participation. Options for private-sector participation include contributions of right-of-way, joint development, benefit-capture, vendor financing through DBOM procurement, and sale-leaseback financing of assets.
- Analysis of alternative financing strategies, including an evaluation of equity contributions, long-term revenue bond financing, short term construction loan financing, and leasing.
- Capital investment analyses, including sensitivity testing.
- Identification and assessment of sources of capital funding, including the potential for private-sector participation, building on prior analyses to the greatest extent possible.

- Financial capability analysis, including capacity of new revenue sources to meet future capital and operating needs.
- Inflation adjustments to capital and operating and maintenance cost estimates.
- Analysis of the risk and uncertainty associated with the estimates.

The extent to which these analytical items are addressed will vary depending on the study phase, and will include continuous refining, updating, and enhancements as better information and data are developed.

The preparation of the financial plan consists of an analysis of the sources and uses of funds. The heart of the financial plan is the development of a projected cash flow analysis using the Financial Analysis Model described above. This analysis integrates the following projections to demonstrate how to fund the program on a year-by-year basis. The financial plan will be structured to project cash flows for a forecast period extending to 2045. The financial plan will project the following capital uses of funds:

- Planning.
- Engineering.
- Design.
- Right-of-way.
- Construction.

This task will be performed between November 2002 and May 2003.

Milestone 6 – Public Participation and Outreach. This task will implement a public participation process concurrent with the other six milestones in the Project Pre deployment and Technical Assessment phase. The process will gather feedback from and inform public agencies, local cities, public officials, community groups, the private sector, and state and federal agencies. The purpose of this task is to inform the public and solicit input from decision-makers. This information will be one of the criteria used to identify an IOS for the SCAG MAGLEV system. Milestone completion date is July 2003.

Milestone 7 – Technology Transfer. Lockheed Martin will act as the focal point for transferring MAGLEV technology from Siemens and ThyssenKrupp to the U.S. In this capacity, Lockheed Martin will be responsible for ensuring the Technology Transfer framework is complete and is compliant with the law, that the framework is followed in developing the Technology Transfer Agreement in Phase II, and that the Technology Transfer Agreement is implemented by the parties in the subsequent phases. If other foreign companies are identified

as candidates for technology transfer in support of the Southern California MAGLEV Deployment, we will work with them also.

In the beginning, the effort will be more technology-trade-analysis driven, where the focus is on assessing the technology that is available and how it could apply to the U.S. and Southern California markets. We will assess applicable U.S. and state laws, safety restrictions, and other local legal constraints. The effort will first focus on U.S. market attractiveness and applicability, and will then shift to an in-depth review of California. This is necessary in order to appraise the full economic and technical implications of the technology transfers.

After we select the candidate technologies we will assess substitute technologies already in the U.S., and look at evolving (soon-to-arrive) technologies. We will create scenario-driven life cycle cost models that look at present investment vs. future technology insertion costs (i.e., "You can pay me now or pay me later"). Ultimately, the technology transfer will net down to a cost/benefit decision. Parametric assumptions (e.g., market penetration; how much TRI can sell here) will affect the balance of the economic equation. The "shelf life" of TRI technology (how long the technology will be robust) will also be a significant consideration.

Once we know which technologies are best suited for the U.S. market (California in particular) and which ones meet cost/benefit criteria, we can then begin serious negotiations about equitable compensation levels (e.g., incentives, fees, and licenses). One idea may be an equity position in MAGLEV projects rather than a straight fee. There are up sides and down sides; however, if an equity approach were used, it could lower initial project outlays.

In summary, as we are assessing the technology transfer requirements, we will be guided by these types of questions and issues:

- Which technologies are candidates to be transferred?
- What is the appropriate degree to which each technology will be transferred?
- What are the limitations, if any, on the use of each transferred technology?
- What are the current technical, market, and economic factors that will influence the long-term viability of the candidate transfers?
- What are the life-cycle cost implications?
- What are the most likely cost/benefit outcomes?
- What is the best method for transferring each technology?
- What is the best schedule and sequencing of the technology transfers?
- How should technology owners be equitably compensated for the technology transfers?
- What is best business arrangement (i.e., the one that will promote a lasting win/win business benefit and level of enduring cooperation between the parties)?

This task will be performed between January 2003 and May 2003.

1.5 Project Task Change Control

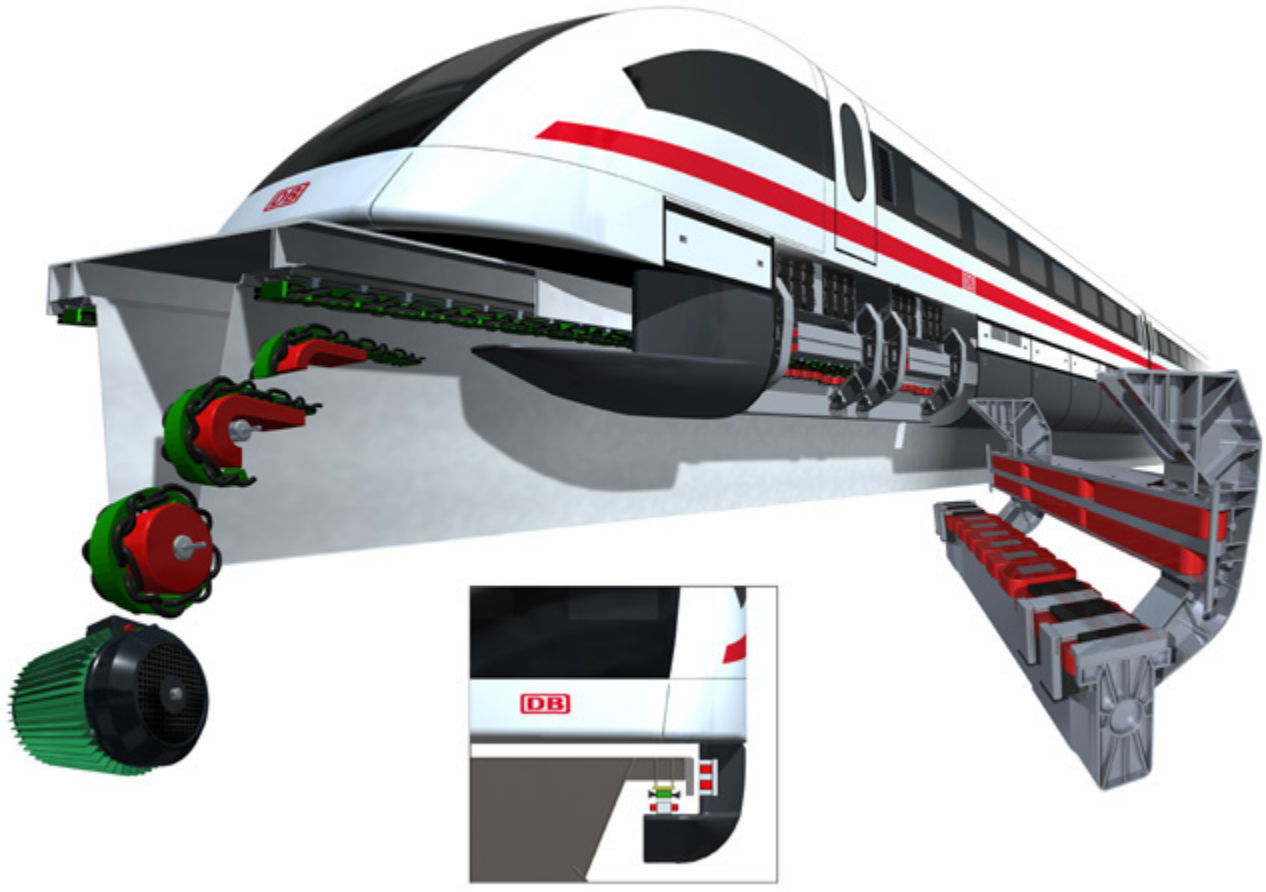
The LM Team will provide the SCAG with the capability to change the baseline program through mutual discussions and documented changes. The process will include informal discussions with SCAG officials on potential impacts to the baseline program in relation to the change task. If mutually agreed upon, the LM Team will submit a change request through contracts identifying the baseline task change and the resulting cost or scope impact. If no funding impacts are noted, the contractor will take immediate action to re-baseline the tasks and schedules accordingly. This re-baseline will be reflected in the master schedule included on the LM MAGLEV Web page within one month of the decision. If the change requested involves funding or scope impacts, the SCAG contracts lead will ask for a Change Proposal for those changes. Once approved by the SCAG, the Master Schedule will be modified and the team will be directed to execute to the re-baselined tasks.

1.6 Project Decision-Making Organizational Structure

SCAG is the lead agency and grantee for the MAGLEV Deployment Services Contract. The LM Team will undertake much of the technical work and coordination described in the work program. Other jurisdictions and agency staff will play important roles in various aspects of the project. A public involvement program will be implemented, closely coordination with SCAG, as part of the project by the LM Team.

SCAG has adopted an organizational structure for the MAGLEV Deployment Services Contract as summarized in Figure 1-2. SCAG will serve as the overall project management of the study with the Consultant Team responsible for the key technical components of the study. Two review processes are envisioned: a formal multi-person peer review process for *policy-level documents*

and a more streamlined process for *technical documents.*



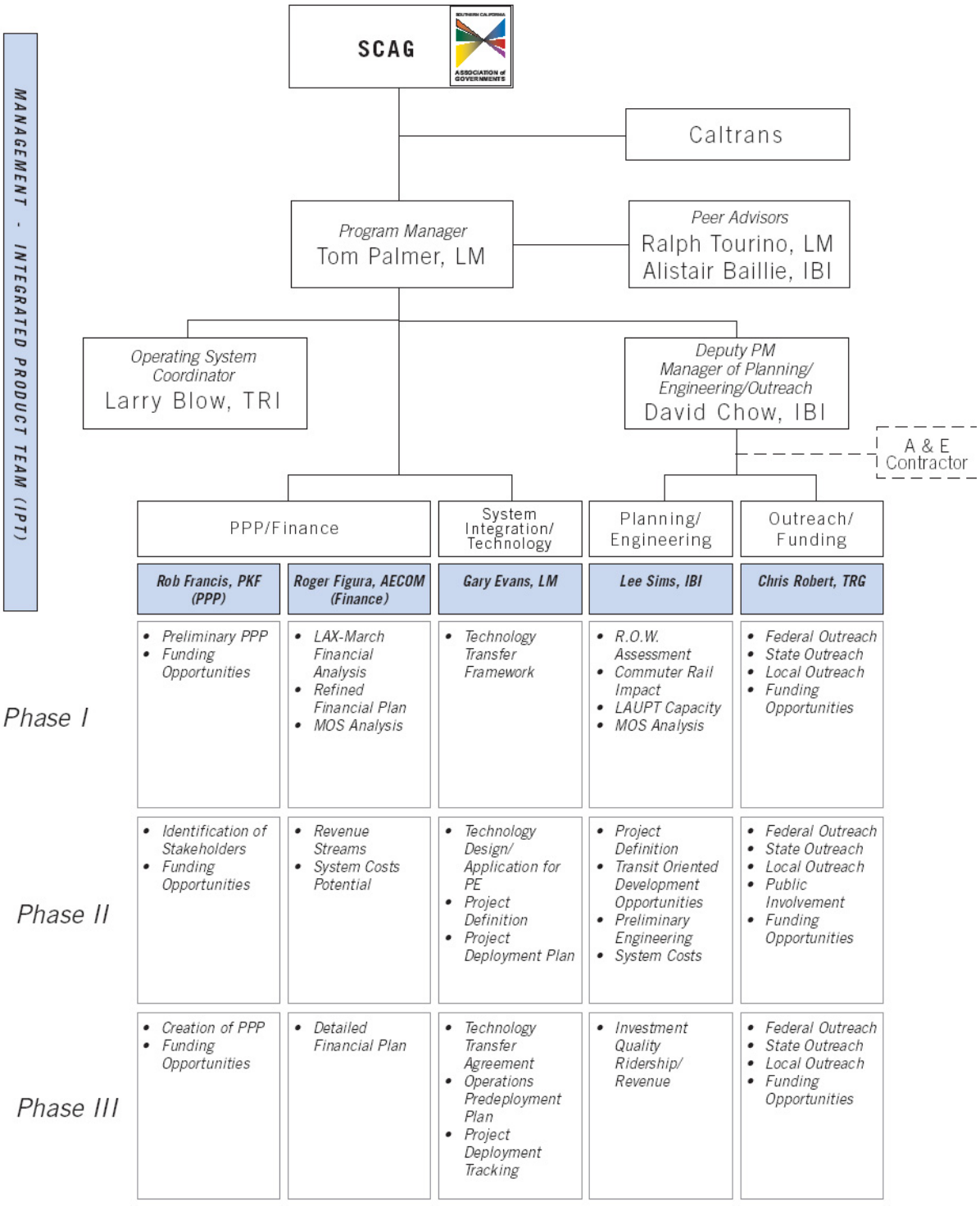


Figure 1-2. Summarized Organizational Structure

The milestones constitute the key decision points during the project approval process. When completed and approved, the milestone reports will demonstrate that SCAG has met its study goals and objectives and that the relevant agencies have been directly involved in the decision-making process.

We will schedule teleconferences or SCAG review sessions every other week with the designated SCAG representative(s). The purpose of these sessions will be to coordinate our activities and seek interim decisions in relation to key team issues. Most of these sessions will be limited to one hour.

We will also hold executive reviews on a periodic basis with designated SCAG executives and the LM Program Director. The purpose of these sessions is to coordinate on upcoming key events and seek direction in major policy, funding, or strategy challenges.

1.7 Agency Coordination

The purpose of agency coordination is to outreach and involve key public agencies that have an interest in the project. Two levels of agency coordination are envisioned for this task. The first level involves coordination with the SCAG MAGLEV Task Force. The second level is with one-on-one communications established through the outreach efforts in Milestone 6 (Public Outreach).

An important part of the project is effectively involving SCAG and other public agencies throughout the decision-making process. The goal will be to achieve consensus on key policy and technical decisions affecting such things as the funding, IOS selection advocacy strategy, project redirections, and agency interfaces.

The MAGLEV Task Force will be consulted on an ongoing basis through the monthly task force meeting schedule. Presentations to the SCAG Regional Council will be made on an as-needed basis as determined by SCAG staff. The following discussion summarizes the specifics in more detail, such as mission, composition, and meeting schedule of each group.

1.8 MAGLEV Task Force

The mission of the MAGLEV Task Force is to:

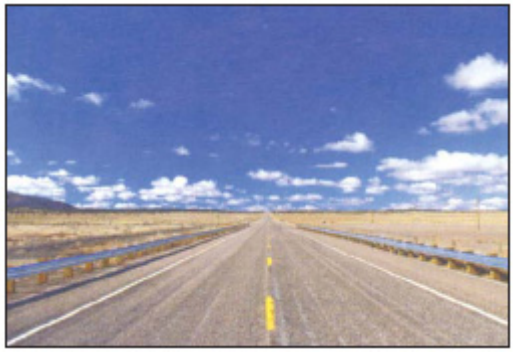
- Serve as the oversight body for this study and the Phase I MAGLEV Deployment Project.
- Provide the communications linkage between the Regional Council and the Project Team.
- Act as participants in the decision-making process.
- Represent agency stakeholders of the project.

The MAGLEV Task Force will meet on the third Wednesday of each month. Currently, the project schedule identifies a minimum of 12 meetings.

1.9 Public Outreach Plan

The first task associated with commencing a public outreach effort is to develop a clear, comprehensive and targeted Public Outreach Plan that will serve as our outreach blueprint. The Plan identifies project-related tasks, milestones, and a proposed timeline to guide the outreach effort while, at the same time, builds in enough flexibility to recognize the dynamic nature of most projects. The Public Outreach Plan addresses approaches to building public support, identifying areas of concern and gaining input from decision-makers. In addition, strategies concerning the active seeking of funds are identified. The development of the Public Outreach Plan will be an evolutionary process with updates and revisions occurring to the document as needed.

1.10 Team Project Management Plan



The detailed Team PMP is provided in this document. It establishes the framework for completing the technical analysis of the project, specifies the project's management procedures and organizational structure of the Consultant Team, and provides guidelines for the orderly interaction and participation of the different team members.

The development of the PMP will be an evolutionary process with updates and revisions occurring to the document as needed. The maintenance of and subsequent revisions to the Team PMP are the responsibility of the LM Program Director. The schedule is posted on the LM MAGLEV Project Web page (https://maglev.external.lmco.com) and the appropriate SCAG and team members will have real time access.

A team approach is emphasized in the PMP, with SCAG as the lead agency and the LM Team with the responsibility for much of the technical work and coordination described in the work program. Other jurisdictions and agency staff will play important roles in various aspects of the project. A public involvement program will be implemented as part of the project by the LM Team through close coordination with SCAG.

Overall responsibility for the study organization is with the SCAG Program Director, who will direct the study team in accomplishing the goals and objectives established for the MAGLEV Deployment Services Contract. The LM Team, under the leadership of the Program Manager and Deputy Program Manager, will perform all technical analyses.

1.2.0 Executive Summary

This Milestone Report is the second in a series of seven milestone reports for the Phase 1 of the SCAG Maglev Deployment Program. The Maglev Deployment Program is a three phase process. Phase 1 is Predeployment Analysis, Phase 2 is Preliminary Engineering and Phase 3 is the Deployment Plan. The purpose of Phase 1 is to establish the project management controls, conduct the activities that are necessary to initiate the program and answer high-level stakeholder concerns, and to identify an Initial Operating Segment (IOS) for the subsequent phases.

On December 5, 2002 the SCAG Regional Council adopted an Initial Operating Segment (IOS) starting at Ontario Airport, going west through the San Gabriel Valley, Los Angeles Union Station, and ending at West Los Angeles. The Project Team, directed by the Maglev Task Force, has developed three alternative alignment solutions to connect these locations, utilizing Right-Of-Ways (ROW) owned by Caltrans, the railroads, and other various owners. The three alternatives include the following major right-of-way corridors:

- Interstate 10 (I-10)
- Union Pacific Railroad / Valley Boulevard
- State Route 60 (SR-60)

The IOS selection process used to pick the regionally preferred starter segment from the various maglev corridors in the Southern California region is described in detail in Appendix A of this report.

Milestone Two, this report, is a focused review of the Initial Operating Segment (IOS) and an analysis of what impacts the maglev system would have on existing transportation systems. This analysis examines three key aspects:

1. The impacts of overlaying an elevated maglev system on the identified highway and railroad rights-of-way (ROW),
2. The potential interaction between the proposed maglev system with Metrolink and other rail systems along the alignment,
3. A segmented ridership assessment of identified maglev lines.

There are seven sections in this report:

1.2.1 Review of Corridor/Previous Work
1.2.2 Identification of System Requirements
1.2.3 Assessment of Rail ROW Impacts
1.2.4 Assessment of Caltrans ROW Impacts
1.2.5 Development of ROW Utilization Strategy
1.2.6 Segmented Ridership Forecasts
1.2.7 Interaction with Metrolink and Other Systems

The following is a summary of each of the primary sections in the report. More detailed information is contained in the body of the report.

Review of Corridor/Previous Work

This section is a concise identification of related studies that were reviewed for this milestone. A number of key studies for maglev deployment have been conducted in recent years. Critical review of the previous studies, corridor investigations, and associated maglev alignments were completed with particular focus on alignment constraint locations and challenging engineering areas.

The following documents were reviewed:

- *Regional Transportation Plan*, SCAG (2001)
- *California Maglev Deployment Program, Project Description and Appendixes A-K*. (LAX to March Corridor), Parsons Transportation Group, (2000)
- *LAX-Palmdale High-Speed Ground Access Study*, IBI Group, (2001)
- *California-Nevada Interstate Maglev Project*, American Magline Group and CA-NV Super Speed Train Commission, (2002)
- *OrangeLine Feasibility Study*, IBI Group, (2002)
- *LAX-South High Speed Ground Access Study*, URS Corporation, (2002)
- Transrapid International (TRI) Technical Papers
- Railroad maps and technical documentation
- Caltrans Route Concept Reports
- Caltrans Project Study Reports and Project Reports
- Approved Environmental Documents
- Environmental Assessment for the California Maglev Deployment Project submitted to FRA, US DOT (Parsons Transportation Group and Myra Frank & Associates, Feb., 2000)
- Caltrans Topographic Right-of-Way maps and drawings, As-Built and Design Drawings

Along with the review effort, the Project Team worked closely with the Southern California Association of Governments (SCAG) to ensure that the latest alignment data and planning studies were being utilized.

Identification of System Requirements

This section identifies the system requirements and technical specifications for the maglev system. The purpose of identifying system requirements is to quantify the right-of-way envelope that is needed to plan the alignment, stations, and other facilities for the system. It is also intended to document the operational and maintenance requirements of the maglev system. Parameters examined include:

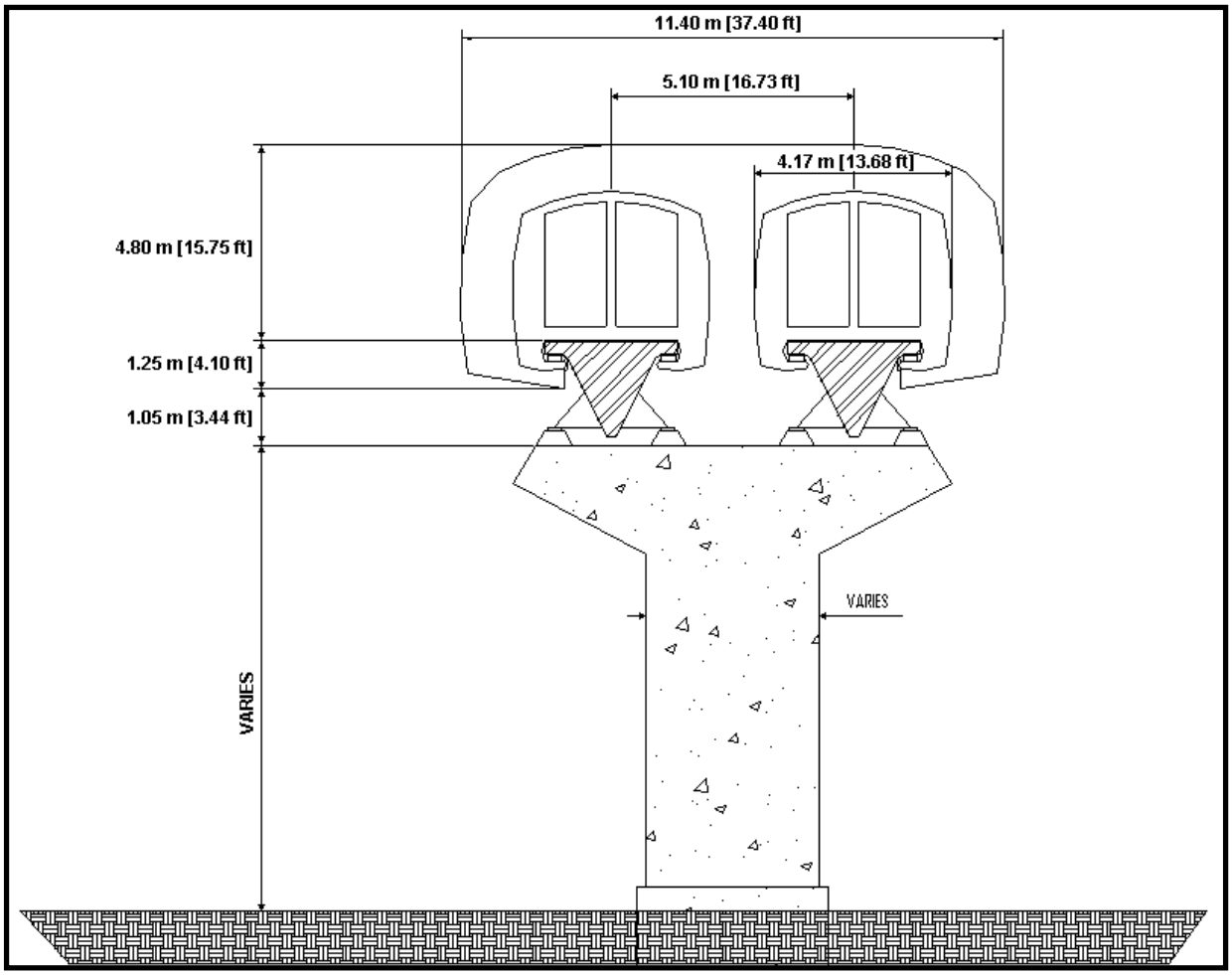
- General Maglev Technology
- Guideway / ROW Alignment
- Guideway Structures
- Vehicles
- Stations
- Operations and Maintenance
- Power Distribution Requirements
- Operational Control System
- System Envelopes

The analysis and evaluation resulted in the development of the following maglev Project Specific System Requirements:

Project Services and Facilities Requirements	
Type of Service	Regional Commuter
IOS Route Length (Double Track)	54.7 mi
Stations (4-5)	12 Ac / Sta
Maintenance Facilities	
Central (5 Bay)	21Ac
Guideway (3 Bay)	8.15 Ac
Outlying (2 Bay)	5.93 Ac
Propulsion Facilities	
Substations (5)	2.0 Ac / Sta
Wayside Switch Station	230 ft² / Sta
Operation Control System	
Manufacturer	TRI
Location	Central Maintenance Facility
Transmission System	38 GHz
Mast Intervals	1,000 ft – 5,900 ft
Number of Trains	10
Sections per Train	10
Seats per Section	70
Maximum Operating Speed	311 mph
Operating Hours	
Monday – Friday	
Peak Operations	5:30 – 9 am; 3:30 – 6:30 pm
Standard Operations	9 am – 3:30 pm; 6:30 – 11:30 pm
Weekend	5 am – 9 pm
Frequency (Headway)	
Monday - Friday	
Peak	10 min

Off Peak	20 min
Maintenance (Scheduled)	
Monday – Friday	12:00 pm – 4:00 am
Weekend	12:00 pm – 4:00 am

The following exhibit represents the clearance envelope used in the ROW/fit analysis:



Maglev System Envelope

Assessment of Rail ROW Impacts

Maglev IOS segments that utilize existing rail corridors were examined. The ROW characteristics, corridor constraints, and potential utility conflicts were identified. As part of the assessment, railroad track charts were used to obtain track curvature information, approximate locations of yards and industry spur tracks, approximate locations of oil lines, and the presence of fiber optic lines. Railroad Valuation Maps were reviewed to investigate the width of right-of-way. At some locations, a site reconnaissance was performed to verify information shown on the railroad track charts and valuation maps.

The suitable rail line ROW for the IOS were identified to be:

- Union Station to Ontario
- Union Pacific RR Alhambra Subdivision
- Union Pacific RR Los Angeles Subdivision

Both the UPRR Alhambra Subdivision and UPRR Los Angeles Subdivision are generally straight alignments, with very few sharp curves, where most curves are two (2) degrees or less. However, both lines have limited ROW between the Union Station and SR-71. The only available ROW is between SR-71 and the Ontario International Airport. This portion of the Alhambra and Los Angeles has been included in the I-10 El Monte/Pomona Station Alternative. The Alhambra Subdivision currently operates mostly freight traffic across its tracks, except for six (6) Amtrak trains per week. The Los Angeles Subdivision operates mostly freight traffic, along with Metrolink commuter trains operating in both the morning and evening rush hours.

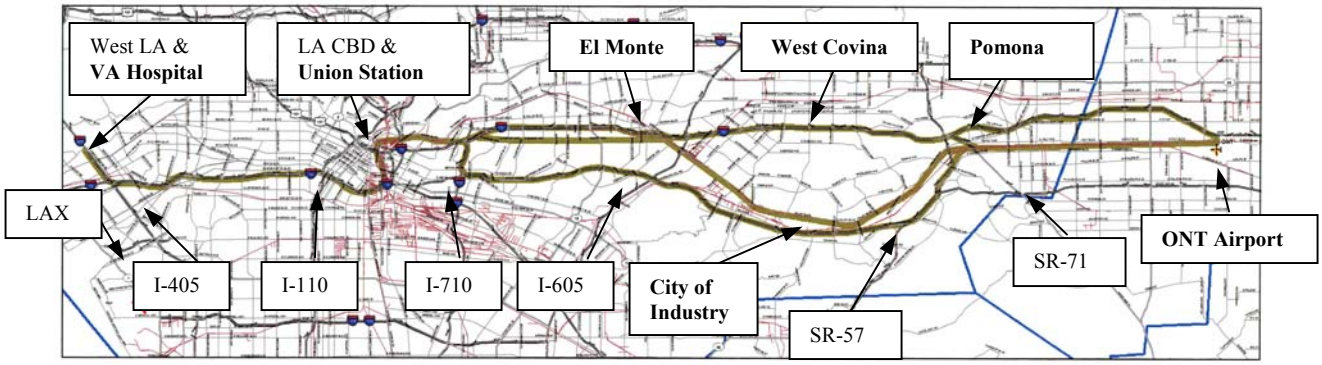
Assessment of Caltrans ROW Impacts

The analysis of the freeway segments was conducted in close cooperation with Caltrans District 7 (Los Angeles) staff with participation from District 8 (San Bernardino/Riverside). This included review of existing freeway plans, aerial photography, and other available mapping resources that were used to develop a comprehensive understanding of the existing and available ROW for maglev system component placement.

Future improvement plans and project study reports were also examined to determine potential conflicts with freeway plans. A resulting future conditions assessment was developed for the IOS freeway segments. Depending on the timing of the future freeway improvement projects (based on available funding for the projects), some locations may preclude the implementation of maglev.

The project team in collaborations with Caltrans staff reviewed and discussed in detail the different freeway corridors identified for the IOS. A range of issues were covered including future planned projects on the freeway system, design standards, constructibility, constrains, “fatal flaws,” identification of trouble spots, horizontal and vertical alignment issues, and speed considerations. The intent was to preliminarily identify which corridors appear to be more viable for maglev development.

Additional discussions will be required in order to determine whether maglev can fit into these corridors given that there is limited space now and that projects now in the planning or design process will further limit any such right-of-way. If maglev development cannot fit into these corridors, the question of additional right-of-way needs may have to be examined. The possibilities of maglev development altering or modifying any of the Caltrans project will also require additional discussions.



Through this process, it was identified that freeway-to-freeway interchanges present a significant challenge for the maglev system alignment. In some instances the interchanges would force the guideway to be very high above the ground. In addition, a significant number of planned HOV-lane additions are in construction or have cleared the environmental process and are currently in design. These new HOV lanes use much or all of the available space within the freeway ROW.

Serious policy questions remain as to the highest and best use for very limited ROW. The next step would be to discuss these issues with policy makers and Caltrans to attempt to arrive at a solution. In reference to the freeway and street corridors, several findings can be drawn at this point.

1. I-10 from West LA to approximately I-110 (Harbor Freeway) has fewer challenges than most corridors.

2. Maneuverings toward and around Union Station from the east and west presents real challenges, as does access to Union Station itself.

3. Use of I-10 (east of downtown LA to Pomona) can be a workable solution, however, policy issues must be resolved.

4. Use of SR-60 is not as attractive a corridor due to its horizontal alignment (curves, resulting in lower speeds and additional costs) and additional mileage.

5. Use of Valley Blvd. and/or UPRR (from I-605 to SR-57/SR-71) looks to be a strong possibility, and warrants additional investigation, especially if I-10 issues (from I-605 to SR-71) will preclude Maglev construction at a cost-effective investment.

6. Use of I-10 (east of SR-71) is not a strong candidate due to lack of space, additional mileage and horizontal alignment (curves).

7. Station issues should be given priority in the areas of West LA and the San Gabriel Valley so that further progress on corridor issues in those area can be made.

Development of ROW Utilization Strategy

A potential strategy to address right-of-way requirements and potential impacts with affected agencies is proposed in this milestone. Working with SCAG's staff, in concert with the Outreach program described in Milestone 6, the Maglev Team has developed a right-of-way utilization strategy consisting of the following two primary components:

- Program Education
- Comprehensive Decision-making Process.

Success of the decision-making process will yield the following accomplishments:

- Political support for the program
- Regions' transportation agency support for the program
- Policies supporting a multi-modal/integrated regional transportation network inclusive of existing and future systems and technologies
- Concept of operations (plan for the management of existing and future transportation corridors containing maglev systems)
- System requirements
- Conflict resolution procedures
- Risk management
- Configuration management
- Operational and maintenance metrics
- Evaluation program

Conflict resolution, risk assessment and configuration management play key roles in the Phase I program. The conflict resolution procedures for the maglev program were comprised of the following:

- Collaborative planning and cooperative problem solving
- Direct intervention and dispute resolution
- Education
- Training

Risk Management has been employed to consider the likelihood that a threat will endanger an asset (e.g., a structure, individual, or function) and to identify actions that reduce the risk and mitigate the consequences of an event, whether natural or man made.

Configuration Management has been implemented to allow maglev to carefully document the current configuration of the system, to provide a sound basis from which to consider making system changes, to ensure the integrity of a system and to make its evolution more manageable, efficient and economical.

The core of the right-of-way utilization strategy is the use of existing public rights-of-way. These ROW have relatively low environmental risks, will reduce the overall cost of the system, and provide the best opportunity to achieve an alignment that can maintain high speeds.

Several introductory meetings were held with Caltrans, LACMTA, City of Los Angeles, and other corridor owners and stakeholders. In addition, special technical meetings have been held with Caltrans Structural Engineers (in Sacramento) and with Caltrans District 7 and 8 staffs. As a result of the meetings with Caltrans District 7 (LA and Ventura counties), the team has been able to identify the following:

1. A detailed assessment of the ROW requirements has been completed and the overall strategy and process is now underway to work with the controlling agencies to receive approval and, ultimately, permission to co-locate within the ROW.

2. Segments of the Caltrans ROW that (at this preliminary level of analysis) have no significant challenges to the deployment of the maglev system.

3. Segments that present some challenges, but are constructible with additional technical work, and perhaps, additional costs.

4. Segments that present significant challenges for which further detailed analysis will be required during Phase 2.

Segmented Ridership Forecasts

The ridership forecasting approach for the Phase 1 Maglev Deployment Program follows the methodology used for previous SCAG maglev studies. Because of the wide range of trip purposes that high-speed maglev can attract, a variety of forecasting tools have been employed to produce ridership estimates for the IOS alternative. These tools include:

- The new SCAG Regional Travel Demand Model;
- The Regional Airport Demand Allocation Model (RADAM);
- Trip-table Spreadsheets.

Some operational assumptions were used in the modeling effort. A list of these assumptions is included in section 1.2.6 of the report. The following alignments were modeled for ridership assessments:

- **Interstate 10 Alignment**: A maglev line connecting West Los Angeles to Ontario Airport paralleling Interstate 10. This alignment is approximately 54 miles in length and contains the following four stations:
  - *West Los Angeles (Wilshire Blvd / I-405)*
  - *Los Angeles Union Station*
  - *West Covina (I-10 near Mall of West Covina)*
  - *Ontario International Airport*
- **Union Pacific Alignment**: A maglev line connecting West Los Angeles to Ontario Airport paralleling Interstate 10 except between El Monte and Pomona where it parallels the Union Pacific Railroad. This alignment is approximately 57 miles in length and contains the following four stations:
  - *West Los Angeles (Wilshire Blvd / I-405)*
  - *Los Angeles Union Station*
  - *City of Industry Metrolink Station*
  - *Ontario International Airport*
- **State Route 60 Alignment**: A maglev line connecting West Los Angeles to Ontario Airport paralleling Interstate 10 except between I-710 and Pomona where it parallels State Route 60. This alignment is approximately 59 miles in length and contains the following four stations:
  - *West Los Angeles (Wilshire Blvd / I-405)*
  - *Los Angeles Union Station*
  - *City of Industry (SR 60 near the Puente Hills Mall)*
  - *Ontario International Airport*

Two variations of the Interstate 10 alignment were modeled as follows:

- *East Ontario Metrolink Station Relocation*: This alternative is identical to the Interstate 10 alignment except that the East Ontario Metrolink Station is relocated to the Ontario Airport Terminal area. This alignment is approximately 54 miles in length and contains the following four stations:
  - *West Los Angeles (Wilshire Blvd / I-405)*
  - *Los Angeles Union Station*
  - *West Covina (I-10 near Mall of West Covina)*
  - *Ontario International Airport*
- *El Monte/Pomona Station Scenario*: This scenario looks at having two stations between Ontario Airport and Los Angeles Union Station. This scenario was analyzed using the Interstate 10 alignment, but could also

use the Union Pacific Alignment. This alignment is approximately 54 miles in length and contains the following five stations:

- *West Los Angeles (Wilshire Blvd / I-405*
- *Los Angeles Union Station*
- *El Monte (I-10 near the El Monte Transit Center)*
- *Downtown Pomona Metrolink Station*
- *Ontario International Airport*

The ridership modeling effort results are summarized in the following table:

Year 2025 Daily Passenger Volumes

Trip Type	I-10	UPRR	SR 60	Ontario Relocation	I-10-El Monte/ Pomona
Peak Commute	28,160	27,820	27,640	30,220	35,710
Off Peak	10,190	9,370	9,250	10,390	14,250
Air Passengers	9,200	8,920	8,850	9,750	11,990
Special Events/Visitors	6,520	6,320	6,490	6,900	8,500
Induced Passengers/ Catalytic Demand	11,510	11,160	11,100	12,180	14,990
Total	**65,580**	**63,590**	**63,330**	**69,440**	**85,440**

Interaction with Metrolink and Other Systems

A question for the region is the impact of the maglev system on adjacent Metrolink corridors and other rail lines. A number of studies[1] have already been completed identifying a synergistic relationship between the systems. The findings indicate that the systems together provide a comprehensive regional transit network and help to meet the unmet demand for the region.

Analysis shows that the market segments for each system are sufficiently stratified to not cause a parasitic relationship. The maglev IOS alternatives will have access to nearly all transit modes at maglev stations. These modes include local bus, express bus, rapid bus, urban rail, and commuter rail.

The following table summarizes the ridership impact on Metrolink and other transit systems and demonstrates that although some transit services experience a small decline in ridership, overall transit use in the region increase substantially as a result of the implementation of the maglev IOS. Notably, the Rapid Bus system is expected to have the largest overall increase.

[1] Studies include the 2000 California Maglev Deployment Program Project Description (LAX-March) and the 2002 LAX-Palmdale High-Speed Ground Access Study.

Changes in Daily Ridership from Baseline

IOS Alternative / Metrolink Line	I-10	UP	SR- 60	East Ontario Metrolink Relocation	El Monte/ Pomona Station
Antelope Valley Line	1,783	1,752	1,752	1,779	1,845
Orange County Line	-543	-608	-560	-545	-427
Riverside Line	3,809	5,258	3,788	5,325	5,660
San Bernardino Line	-1,707	-841	-1,724	-1,612	292
Ventura County Line	620	600	610	621	662
91 Line	1,719	1,708	1,704	1,719	1,877
All Metrolink Lines	5,472	7,729	5,348	7,058	9,802
All Amtrak Lines	3,144	2,968	3,125	3,438	3,268
Total Commuter Rail	**8,616**	**10,697**	**8,473**	**10,496**	**13,069**
Urban Rail Systems					
Blue Line	-261	-417	-369	-287	219
Red Line	1,165	1,040	906	1,325	2,082
Green Line	3,543	3,545	3,493	3,535	3,695
Gold Line	1,106	852	1,074	1,153	1,216
Eastside LRT	60	-224	30	66	5
All Urban Rail	**5,261**	**4,405**	**4,640**	**6,020**	**7,356**
Regional Systems					
MTA Local Bus	34,361	34,205	30,315	34,452	26,631
Other LA County Local Bus	33,741	35,853	34,419	33,766	33,653
Non LA County Local Bus	13,259	13,317	11,863	13,448	14,404
MTA Express Bus	8,528	8,866	8,643	8,375	8,332
Other LA County Express Bus	8,626	6,725	6,537	8,627	9,899
Non LA County Express Bus	30	33	10	25	23
Rapid Bus	50,351	47,822	44,704	50,363	65,331
Urban Rail/Guideway	5,261	4,405	4,640	6,020	7,355
Metrolink	8,616	10,697	10,396	10,496	13,069
Maglev	65,600	63,600	63,340	69,400	85,400
Totals	**228,373**	**225,522**	**214,867**	**234,971**	**264,098**

1.3.0 Executive Summary

This Milestone Report is the third in a series of seven milestone reports for the first phase of the SCAG Maglev Deployment Program. The Maglev Deployment Program is a three phase process. Phase 1 is Predeployment Analysis, Phase 2 is Preliminary Engineering and Phase 3 is the Deployment Plan. The purpose of Phase 1 is to establish the project management controls, conduct the activities that are necessary to initiate the program and answer high-level stakeholder concerns, and to identify an Initial Operating Segment (IOS) for the subsequent phases.

Milestone Three, this report, is a review of capacity at the Los Angeles Union Passenger Terminal (LAUPT), more commonly known as Union Station, relative to maglev and the planned systems that tie into it. Three key elements are examined in the study: Rail, Pedestrian, and Roadway capacities. There are six sections to this report:

1.3.1 Previous Studies
1.3.2 Key Project Issues and Caveats
1.3.3 Key Goals and Evaluation Criteria
1.3.4 Railroad Evaluation
1.3.5 Pedestrian Evaluation
1.3.6 Roadway Evaluation

The following is a brief discussion of each of the primary sections in the report. More detailed information is contained in the full report.

Previous Studies

A number of key studies of Union Station have been conducted in recent years. Although some of the information is now outdated, the previous studies provide a significant foundation for the development of this milestone report. The documents reviewed include but are not limited to the following:

- *LAUPT Long-Range Capacity and Access Study*, Kimley Horn & Associates for SCAG, U.S. DOT, Caltrans Division of Rail, LACMTA, January 1995.
- *Project Study Report: Run-Through Tracks Across US-101 for LAUPT*, HDR Engineering for Caltrans, June 2000.
- *Los Angeles-Bakersfield High-Speed Ground Transportation Feasibility Study*, Parsons Brinkerhoff/KPMG Peat Marwick, December 1994.
- *Los Angeles to San Diego via Orange County High-Speed Train Alignments/Stations Screening Evaluation*, IBI Group for California High Speed Rail Authority and U.S. DOT Federal Railroad Administration, July 2001.
- *Alameda District Plan Transportation Study*, Korve Engineering for Catellus Development Corporation and RVP/U.S. Postal Service, May 1995.

Key Project Issues and Caveats

The study of Union Station provides a unique challenge due to a variety of issues related to the property, systems that tie into it, and future plans. As a result, a number of significant points are highlighted in this section to clarify the limitations of the study and identify the degree to which the analysis is valid. They are summarized below:

Issues:

- A number of projects are being planned for the Union Station property, both public and private. The Union Station condition is dynamic.
- The Union Station is privately owned and managed by the Catellus Urban Development Group. The owner is committed to making Union Station a premier transit hub for the Los Angeles area. Any recommended transportation solutions must be accepted and closely coordinated with the development activities.
- Numerous transportation projects and feasibility studies are currently underway and involve the use of the Union Station as a major transportation hub. Communication and coordination between these various studies is necessary to minimize duplication of work and potential land availability conflicts related to the projects under study, the existing transportation services, and any proposed developments.
- This study examines a horizon year of 2025. Therefore, this is only a slice in time for the development of Union Station.
- It is believed that improvements to the facility will be implemented in a phased manner to use capital resources efficiently and to prevent the disruption of the existing transportation services and passenger access throughout the facility. Therefore, the horizon year may not be capturing the ultimate plan.
- Analysis was focused on the geographical limits of Union Station/Terminal Annex site (except for the rail analysis, which examined train movements in the adjacent river corridor rail network). The analysis does not focus on transportation facilities outside the study area. Other planning and engineering studies are being conducted to determine those impacts.
- This study effort can be a mechanism for the coordination of many diverse transportation agencies and companies that operate in the Union Station vicinity.

Caveats:

- This study is a planning level review and update of the 1995 LAUPT Long Range Capacity and Access Study.
- The analysis is limited by the available information provided by LACMTA, Metrolink, and Catellus Urban Development Group. As the Maglev Deployment Program proceeds, new information may become available that may alter findings.
- This study is being conducted at a general planning level. Future studies will need to address more specific design and operating solutions with more precise capital and operating cost estimates. However, this study can assist local decision-makers in planning for the future of the Union Station.
- All improvements anticipated by the study are subject to funding and budget constraints that may or may not affect planned improvements.
- The operational and physical improvements identified in this study are for planning purposes only. Union Station stakeholders may not have made decisions on implementation of service and facility changes tested in the analysis.
- This study examined only physical and operational improvements designed to improve the transportation capacity at Union Station. It does not deal with jurisdictional issues related to the future operation and administration of the facility; those issues will need to be addressed in subsequent studies.
- The identified time frames for analysis (2025) are provided as background frames of reference for study purposes only. The actual implementation of capital improvements described in the report may not occur until demand-level triggers are actually reached.
- This study is being performed to identify the problems that Union Station will face in the future due to the forecasted increase in travel demand. This study does not provide design solutions.
- The location of a future platform serving California High Speed Rail Authority trains was not yet identified. The assumptions included in this report regarding its location are based on the best information made available to the project team by the California High-Speed Rail Authority at the time of this study. When such information is finalized, further analysis may be needed to determine its impacts on Union Station passenger flows.

Key Goals and Evaluation Criteria

The purpose of the study is to conduct an analysis of the capacity at Union Station relative to the introduction of maglev service. The goal is to identify areas where there may be constraints in the future and to conduct an initial assessment of how maglev may tie into this significant transit hub. As described previously, the capacity analysis of Union Station consists of three key components: Rail, Pedestrian, and Roadway. The evaluation criteria used to assess these three components are detailed in the report and summarized below:

Railway Evaluation Criteria

The railroad analysis used for this study follows the 1995 LAUPT Capacity and Access Study approach. It uses qualitative analysis of the railroad infrastructure conditions in and around Union Station. The analysis intends to determine if there is the necessary capacity to support the expected and forecasted rail operations in the horizon year 2025. The focus of this analysis is to examine Union Station capacity relative to a connection with the maglev system.

Pedestrian Evaluation Criteria

Level of service experienced by pedestrians throughout the peak hour was the main measure of performance. John J. Fruin's Pedestrian Planning and Design is an authoritative reference for planning and design of pedestrian facilities. As in the 1995 Long-Range Capacity and Access Study, a LOS C (or better) was considered acceptable. LOS C denotes 15-25 square feet per pedestrian in walkways, 10-15 ft^2 per pedestrian on stairs, and 7-10 ft^2 per pedestrian in queues.

Roadway Evaluation Criteria

The roadway analysis uses the same methodology that was used in the Alameda District Plan Transportation Study Report in May 1995. For all segments, a standard peak Level Of Service (LOS) analysis was used:

LOS	V/C Ratio
LOS A	0-0.599
LOS B	0.600-0.699
LOS C	0.700-0.799
LOS D	0.800-0.899
LOS E	0.900-0.999
LOS F	1.000 and greater

LOS of impacted arterial links were determined as follows:

LOS	Final V/C Ratio	Project Related Increase
LOS C	0.700-0.800	0.080 or greater
LOS D	0.800-0.900	0.040 or greater
LOS E, F	0.900 and greater	0.020 or greater

Impacts on freeway segments and freeway ramps were determined by considering if the LOS is F and the v/c ratio increases by 0.02 or greater, or if the project increases the LOS to F from E or less.

Railroad Evaluation

The railroad capacity evaluation of Union Station was performed as an update of the 1995 study, and includes expected impacts of maglev on train operations at Union Station. The purpose of this evaluation was to determine what would be the impacts of maglev on train operations at Union Station if any. It is expected that maglev would not have any major impact on train operations at Union Station as a fully elevated system. The planning for the maglev station within Union Station is to have the maglev platforms elevated above either Platform 4, or the road immediately west of the Gold Line LRT platform, which is the old Platform 1. The maglev trains would enter Union Station on an elevated guideway that would be routed so that it does not interfere with operation of the existing surface tracks.

Rail traffic at Union Station has increased considerably since 1995, and will continue to grow over the next 30 years. As the population in Southern California continues to increase, the demand for transportation will increase even more, as the urban area expands and people move further out from the urban core to find affordable housing. The hub of the public transportation network has once again become Union Station, as the Metrolink commuter rail and Metro Rail subway and light rail systems are expanded.

To date, the largest increase in the number of trains at Union Station has been due to the startup and expansion of Metrolink commuter rail service. Over the next thirty years, it is anticipated that the number of commuter trains will increase by about 125%. These trains will also be longer and carrying more people. In order to keep up with the demand for rail service into Union Station, there must be ongoing projects to expand the capacity of the station. Between the last capacity study in 1995 and now, several improvement projects have been carried out, both within and outside of Union Station. Some of the major projects that are currently on the way are:

- The Alameda Corridor East Project
- The Run-Through Tracks Project
- California High-Speed Rail Project
- SCAG Maglev Deployment Program
- Fifth Lead Track Project
- East Bank Track Modifications
- MTA Gold Line and East Los Angeles Light Rail Extension

Based on the review, maglev is not anticipated to have significant impacts on rail capacity for Union Station. Support foundations for a maglev guideway can be woven between rail tracks underneath. This would allow traditional rail to operate unimpeded by maglev.

Pedestrian Evaluation

The pedestrian capacity evaluation of Union Station was performed as an update of the 1995 study, and includes identification of impacts from projects that had not been envisioned at the time of that study. The purpose of this evaluation was to determine how the available pedestrian circulation areas of Union Station would be able to accommodate passengers, as Union Station activity increases in the future. In addition, this evaluation provides an estimate of Union Station improvements that will be required to accommodate future service, including high speed maglev.

The evaluation of year 2025 operations at Union Station showed that pedestrian traffic in some areas reached the physical capacity of the facility. Specifically, the main pedestrian tunnel end points and access points to the Red Line appear to be the primary bottlenecks. The main tunnel experiences a relatively low level of service, indicating significantly reduced walking speed for most or all pedestrians, some interruptions in pedestrian flow, and severely restricted multidirectional flow of pedestrians. The West Portal Red Line access reached a queue length of approximately 200 pedestrians. It is recommended that maglev passengers, who are assumed to be arriving at an elevated terminal, bypass the main tunnel due to congestion. The study assumed that a 3rd portal to the Red Line from Platform One would be available in 2025. An additional (4th) portal to the Red Line is also strongly recommended.

Roadway Evaluation

The roadway capacity evaluation section evaluated and updated the analysis on roadway capacity based on future levels of vehicle trip generation for Union Station. In 1995, the Alameda District Plan Transportation Study Report, in conjunction with the Catellus Development Corporation and Ratkovich Villanueva Partnership, was completed, analyzing the full development of the Union Station and Terminal Annex properties. This study focused on auto and parking access at Union Station and offers a complete analysis of traffic circulation. A large number of the trips projected to access the site was anticipated too.

In order to determine the impact of maglev auto access trips at Union Station, the projected maglev trips were added to the background transportation network. Traffic conditions were then analyzed to determine potential significant impacts. The future horizon year for traffic conditions for this analysis is 2025. Impacts on freeway segments and freeway ramps were deemed significant if the LOS is F and the V/C ratio increases by 0.02 or greater, or if the project increases the LOS to F from E or less, per Los Angeles County CMP guidelines.

The area around Union Station will be reasonably more congested in the future. But as the primary transit hub in Los Angeles the volume of additional maglev related traffic that is expected on the highway network is not expected to significantly increase the number of study segments and ramps that a LOS of E or F. However, some study segments and ramps are expected to experience significant impacts as discussed above. The following arterial and freeway segments are expected to experience significant impacts:

- Hill Street north of College Street.
- US-101 between Vignes Street and Mission Road.
- US-101 between Hill Street and Grand Avenue.
- Mission Road On-Ramp to SB US-101/EB I-10.

Mitigations to the identified impacted roadways are discussed in the body of the report. It should be noted that auto access will continue to be a significant way for getting to Union Station. maglev along with other systems and projects that tie into Union Station should identify their potential share of required impacts and account for improvements to the roadway network that would facilitate acceptable auto access.

1.4.0 Executive Summary

This executive summary provides an overview of the Public/Private Partnership (PPP) option analysis.

Introduction

The option analysis prepared by Advalus for the Southern California Association of Governments (SCAG) provides an insight into the formation options for a suitable PPP to sustain the MAGLEV route project. The PPP is, in a holistic sense, the means by which the project's organizational plan, technical solution, financial plan, proposed legal structure, and implementation timescales could be brought together as a coordinated execution proposal. Essentially the PPP analysis adopts the financial conclusions reached in Milestone 5 in relation to project financing, and considers the allocation of public/private sector roles that will best facilitate and implement the overall project. In short, the PPP as a legal and financial structure would own and implement the project's business case. The size and scale of the project means that it is more appropriate to refer to it as a program.

The analysis supporting Milestone 4 consists of six components:

- 1.4.1 Definition of the PPP's Purpose.
- 1.4.2 Definition of Roles and Functions of the Public and Private Partners.
- 1.4.3 Identification of Legal and Institutional Issues.
- 1.4.4 Identification of the Equity Contribution of Each Partner.
- 1.4.5 Identification of an Administrative Structure.
- 1.4.6 Development of an Implementation Action Plan.

The analysis and conclusions for each are described in subsequent sections of the Milestone 4 report.

Definition of the Public/Private Partnership's Purpose

The centerpiece of a successful PPP deal is the legal and financial structuring of the roles and relationships between the public- and private-sector participants. A successful and relevant PPP is achieved by bringing the relevant range of private-sector investment, management, technical, commercial, and creative skills into the overall project, and not simply relying on an innovative form of project financing. Taking a holistic view of the PPP as an overarching and top-down means of delivering an integrated service program also provides the opportunity to introduce private-sector incentives for efficiency measures throughout the design, asset creation, maintenance, and if applicable, operation of the program.

The public-sector participations in a PPP structure must be assessed in terms of the service case for the project's service outcomes; the legal justification (i.e., the basic legal powers to set up any new constitution or contractual matrix that may be required to implement the PPP); and the financial justification, which would cover affordability, Value for Money (VFM), and the ability to commit future budgets or increased revenue in favor of the project.

Definition of Roles and Functions of the Public and Private Partners

The ultimate ownership of the PPP program must be vested in the hands of the public agencies that have the relevant regional responsibilities for both public transportation and economic development. Conversely, the ownership responsibilities within the PPP must reflect the downside risk of who is ultimately responsible in the event of failure. Other public agencies that have a more specific geographic focus or a service delivery interest (in the adjacent or multi-modal opportunities presented by this MAGLEV corridor as a new high-speed route) should be aligned within the PPP either as invited members or as contractual counter-parties.

The SCAG has adopted a network of high-speed MAGLEV lines as part of their regional transportation plan. Joint Power Authorities (JPAs) have been proposed as the implementing constitution for the program ownership responsibilities of the public-sector agencies. It may make sense to consider a regional-level JPA within Southern California to provide a realistic strategic perspective.

The execution of the PPP's business case, like any other substantive commercial business, is likely to need its own client-side executive, a reliance upon external funders, and the involvement of private-sector contractors in both the design, build, operations, and maintenance (DBOM) of the MAGLEV route, as well as transport-orientated development along the route corridor.

Identification of Legal and Institutional Issues

The JPA, as a public-sector alliance, would not be expected to have the internal skills and resource to run the program. The PPP exists to provide the MAGLEV service over 30-plus years. The justification for the PPP relies upon a commercial business proposition that the overall program can be self-financing. This is not a conventional public-sector mandate, and the JPA is likely to require an executive directive that is consistent with its business objectives.

The proposal would be to place either a separate non-profit-making public/private corporation or an incorporated subsidiary of the JPA into the vertical PPP structure.

In the initial stages of the MAGLEV route project, there will be relevant risks that the JPA and the public/private corporation will need to address. These include:

- Route determination, right-of-way review, and acquisition.
- Ground and environmental conditions.
- Interface with utilities and utility owners.
- Consents and permits.

The list below summarizes some of the key risks from the private-sector perspective.

- Development and acquisition of the route.
- Development, construction, maintenance, and management of the MAGLEV system.
- Contract length.
- Availability of the requisite skills and resources.
- Subsequent availability and service performance of the MAGLEV system.
- Technology/Operations/Maintenance risk-sharing arrangements.
- Volume and demand risk.

- Credit risk of the public private corporation.
- Market overheating and strikes.
- Latent defects.
- Change of law.
- Termination/Compensation.
- Refinancing.
- Strength of program support in the public-sector community.

Identification of the Equity Contribution of Each Partner

The capital cost is the construction cost expressed in year-2000 dollar values. Inflation and capitalized interest cause the future cost to increase to $9.3 billion in year-of-expenditure dollars.

CATEGORY	West LA-Ontario IOS
Capital Cost	$5.5 Billion
O&M Cost	$50.8 Million/Year
Revenue	$265.3 Million/Year
Payoff Year	2040

It is anticipated that project-generated revenues will support funding for the project. Three specific financing mechanisms – short-term debt, the Federal Transportation Infrastructure Finance & Innovation Act (TIFIA) program, and tax-exempt financing – have been factored into the current financing plan. The following table identifies these capital-funding sources.

YEAR	CAPITAL SOURCE	% TOTAL CAPITAL APPLIED
FY04	S.T. Commercial Paper	0.50%
FY05	S.T. Commercial Paper	0.50%
FY06	TIFIA Loan + Tax-Exempt Financing	20.00 %
FY07	TIFIA Loan + Tax-Exempt Financing	20.00 %
FY08	TIFIA Loan + Tax-Exempt Financing	20.00 %
FY09	TIFIA Loan + Tax-Exempt Financing	20.00 %

The financing plan could be enhanced and added to by the following major elements:

- Federal grant sized to reflect the Net Present Value (NPV) of new federal tax revenue generated as a result of MAGLEV implementation and operation.
- State of California Industrial Development Bond (IDB) sized and supported to reflect the NPV of new state tax revenue generated as a result of MAGLEV implementation and operation.
- Bond funding supported by revenue generated from the creation of Tax Increment Financing (TIF) Districts.
- Vendor participation by the German government to finance the vehicles through a note receivable.
- Airport contribution to reflect the value of rationalized air service in the Los Angeles basin and homeland security considerations.
- Sale-leaseback upfront revenues generated by selling off tax benefits.

Identification of an Administrative Structure

A new public/private corporation should carry out the executive function of the PPP, either as an extension to the JPA or as a separate company in its own right. The purpose of a three-tier structure is to distinguish between the key functions within the PPP, which include:

- Program ownership and sponsorship – This is a logical responsibility for the JPA and its member agencies/authorities to sustain.
- Program executive and overall coordination of the PPP's business case, obligations and long-term viability – The distinct mix of funding and economic activity required to deliver this program means that it is not exclusively public or private by function – hence its literal eligibility as a public/private corporation.
- The carving out of distinct work packages as private contracts, including the substantial DBOM contracts, the economic and urban development contracts, etc. that will be packaged and contracted out of the PPP; in fact, all the way down to the smaller scale support service and advisory contracts that the PPP, as a holistic program, will need to put in place.

In creating the framework for both the DBOM contract and the wider PP program, the not-for-profit corporation must, at the outset, be able to anticipate, define, and specify the miscellany of contracts that it will ultimately need to enter into. This slightly circular point explains the need for private-sector participation in both the corporation and its day-to-day executive. The absence of any direct equity in the not-for-profit corporation means that the security for all participants in the PPP (both corporate and individual) will be the quality, suitability, and effectiveness of the contracts being entered into. As described in an earlier section of this milestone, the contractual matrix that links the parties governs the PPP.

Development of an Implementation Action Plan

An integrated project implementation plan has been provided as part of the program management milestone (Milestone 1).

Executive Summary

This Milestone Report for the Financial Plan is the fifth in a series of seven. This preliminary draft financial analysis prepared by AECOM Consult, Inc. (ACI) for the Southern California Association of Governments (SCAG) provides cost and revenue estimates for the proposed West Los Angeles to Ontario Maglev IOS operating scenario. The total project costs include capital and operating costs, and contingencies. The revenues include fare revenue, freight revenue, concessions and advertising revenues and parking revenue estimated for a stand-alone IOS system. Funding for the construction and operations of the project is anticipated to come from project generated revenues and does not include any public subsidy.

Assumptions for the analysis include:

- Construction period occurs through 2010
- Revenue service commences in 2011, with revenue assumed at 75% of 2025 horizon year forecast
- Revenue is grown uniformly to 2025 levels
- Revenues and costs are escalated at 3% per year to provide analysis in year-of-expenditure dollars
- Project is totally leveraged through debt financing

Following are some of the key findings from the Phase 1 analysis:

- Capital requirements require large front end costs, that increase with escalation and interest expense (capitalized interest)
- Unlike a typical transit project, revenues far exceed operations & maintenance expenses by a ratio of about 5 to 1
- Payoff year occurs in year 2040 when all debt is retired
- Unlike a typical transit project all capital costs including escalation and financing costs are returned from project revenues.

Phase 1 was used to test the general financial feasibility of the project. Phase 2 will focus on identifying other revenue sources and financing mechanisms to bring cash into the project earlier in the implementation phase to better match cash requirements of a large-scale infrastructure investment.

1.6.0 Executive Summary

This Milestone Report, Public Participation and Outreach, for the Maglev Deployment Program is the sixth in a series of seven reports. The report documents the strategic, comprehensive and systematic approach taken by the Project Team to interface with key stakeholders. The goal is to provide a steady flow of up-to-date information and collect feedback about specific elements of the Maglev Deployment Program as it moves forward through significant milestones. A secondary objective of the outreach plan is to build understanding of the Program so that key elected officials, impacted municipalities, regional opinion leaders and other influential stakeholders would ultimately support the Program into its next phase.

The value and primary goal of the outreach task is to establish a dialogue and support for the SCAG high-speed intraregional system. The selection of an Initial Operating Segment (IOS) and ongoing policy discussions for a regional maglev system are examples of the outreach effort and reflect both the level of strategic planning and thoroughness employed throughout public involvement activities.

The Milestone 6 Report of the Maglev Deployment Program consists of the following seven components:

1.6.1 Overview of the Public Outreach Plan
1.6.2 Stakeholder Identification
1.6.3 Agency Coordination
1.6.4 Stakeholder Briefings
1.6.5 Collateral Materials
1.6.6 The Website
1.6.7 Press/Media Relations
1.6.8 Summary of Findings

Each component represents an important element of the public involvement effort, critical to a thorough and comprehensive program aimed at both informing key stakeholders and also at identifying and nurturing newly interested parties.

The approach includes development of a detailed database of regional stakeholders. Utilizing a tiered approach, agency representatives, elected officials and key staffers from every level of government including municipal, state and federal offices were identified and briefings provided. Additional stakeholders such as Catellus Development Corporation, owners of Los Angeles Union Station, were provided detailed presentations. In all briefings comments and concerns were noted, analyzed and addressed. Fact Sheets, presentation and briefing materials were developed and distributed. The entire effort is complimented by a web site where these and other relevant materials could be readily accessed by stakeholders. It should be noted that this milestone summarizes the outreach efforts for a period from June 2002 to June 2003. Subsequent efforts will be documented in follow-up efforts in Phases Two and Three of the Maglev Deployment Program.

Overview of the Public Outreach Plan

The Public Participation and Outreach Plan utilized the following approach:

- Initial outreach was directed to key elected officials, policy-makers and influential stakeholders;
- Efforts were primarily focused on an Initial Operating Segment (IOS) from Ontario to West Los Angeles with ongoing activity also in the LAX to Palmdale, Anaheim to Union Station and Cal / Nevada corridors;
- Clear and thematic presentations were developed, tailored for individual audiences and provided on an ongoing basis to appropriate individuals and organizations;
- A Website was developed to augment outreach efforts;
- Fact Sheets were developed, distributed and posted to the web site; and
- Briefings with key elected officials, impacted Councils of Government and stakeholders were conducted in a timely, ongoing and carefully planned manner.

Stakeholder Identification

This section provides an overview of both elected and civic stakeholders identified throughout the Study process. Elected officials identified included both those with portions of proposed alignments in their districts, and representatives with key committee or leadership assignments. Municipal and civic stakeholders were identified in their capacities as either influential policy makers or leaders of active organizations or those organizations themselves, with a focus on business and economic development, transportation and land use advocacy.

Agency Coordination

Briefings were held with a number of governmental entities including the Los Angeles World Airports (LAWA), City of Los Angeles Department of Transportation (LADOT), Los Angeles County Metropolitan Transportation Authority (MTA), Southern California Regional Rail Authority (SCRRA), Caltrans and others. Presentations were also made to impacted Councils of Government (COG) representing an overwhelming majority of the cities in Los Angeles and San Bernardino counties. The COGs contacted include Arroyo Verdugo, Gateway, North County Transportation Coalition (the de facto COG for North Los Angeles County), San Bernardino Association of Governments, San Bernardino Technical Advisory Committee, San Gabriel Valley, South Bay, and Western Riverside.

Stakeholder Briefings

Key stakeholders were reached through a carefully calibrated strategy that included a combination of individual briefings, public presentations to existing, active organizations, dissemination of fact sheets, a web site and other mechanisms. Key to

any successful outreach effort is for opinion leaders to know that they are included in the decision-making process. For this reason, the project Team made sure the flow of information with key stakeholders was continuous and two-way.

The Project Team developed a multi-tiered approach whereby elected officials and key stakeholders such as Catellus Development Corporation are "first tier" stakeholders for ongoing briefings throughout the deployment program. Once Joint Power Authorities for the appropriate corridors are formed, the next phase of briefings could include other stakeholders such as property owners, civic and residential organizations and others as identified by individual JPA's.

Collateral Materials

Collateral materials were developed and distributed throughout the study process. Collateral materials consist of one-page fact sheets on the project, PowerPoint briefings, executive summaries of the milestone reports and presentation to the SCAG Maglev Task Force. Also, a project video was produced and made available for stakeholders and the media. Given the complexity and technical nature of the subject matter and plethora of transportation projects taking place across the region, it was vital that concise yet descriptive and easily understood information about the study be made available to stakeholders in an easy to understand format.

The Website

A Study Website, created to establish a user-friendly interface, was developed and updated regularly during the course of the study. Project information, project description, project related news and updates, maps, graphic representations of routes being studied, alternatives and financial analysis; system concepts; and technology description represent a sample of the information available for review and/or downloading from the Website. The Website is a useful tool in ensuring that stakeholders (i.e. policy makers and their staffs) can access current, approved information when needed and provided the opportunity for members of the general public to learn about the project as well. The internet address for the ongoing maglev efforts is: www.calmaglev.org.

Press/Media Relations

In addition to briefing packets, fact sheets, a web site and other tools used to broadly disseminate information about the Maglev Deployment Program, another key effort was media outreach. The objective of media outreach efforts were to provide up to date information to the region on maglev deployment progress through the selection and prioritization of alignments and to publicize the success of the system in Shanghai in order to build momentum and demonstrate viability for the Southern California system. Media activities included the preparation and distribution of media advisories including "b-roll footage" from Shanghai and route maps. Additionally a number of key SCAG representatives were made available for interviews and background information.

Summary of Comments

The Public Involvement Plan yielded a wide range of comments, they include:

- Strong support for a high speed maglev rail system that will connect regional transportation hubs, provide potential relief of pressure on local airports and conserve energy.
- Genuine concerns of a faltering state economy combined with skepticism about past public private partnerships and questions about the maglev technology.
- Concerns about compatible land uses with stations and tracks.
- Concerns that this system may compete with existing Metrolink service or other proposed high-speed rails system.
- Questions of funding and financing, especially in the current economic climate.

Comments collected during the course of the Study have been summarized and prepared in the narrative and contained in the report. These comments reflect the general sentiment of key stakeholders and provide a broader context for recommendations made regarding next steps.

1.7.0 Executive Summary

The national transportation infrastructure is stressed to provide rapid mass transportation at medium-haul distances not economically viable for the aircraft industry. There is a commitment at the national level to implement state-of-the-science international MAGLEV capabilities while capturing sufficient intellectual property to foster economic growth in American-owned firms, employ skilled American workers, and provide the know-how and experience to design and build MAGLEV systems anywhere in the U.S. and around the world. Technology transfer of MAGLEV technology is a priority in these programs.

This study outlines the technology transfer methods, strategies, stakeholders, rules, assessment factors, and the resulting framework. This framework will be used in the upcoming Predeployment Phase to sign a technology transfer agreement with the current owner of the German MAGLEV technology, Transrapid International (TRI). This study concludes by describing the current baseline for the "Transfer Elements and Timing."

From the TRI standpoint, there are certain distinctive features in the implementation of a MAGLEV demonstration project in the USA: the superspeed Transrapid MAGLEV technology is a highly innovative technology in ground transportation, consisting of complex subsystems and components, whose accurate interplay during project implementation is of extraordinary significance. It is indispensable for the success of the project that the interfaces be precisely coordinated. TRI-USA has exclusive access to the system knowledge and the entire system know-how possessed by TRI KG, excluding research and manufacturing. TRI-USA therefore has an obligation, as the provider of the technology, to point out that for the first project implemented in the USA—given the quality and delivery conditions including the short implementation period—the technology provider must supply certain critical subsystems and components.

A premature division of critical system components through open procurement in the marketplace would, according to TRI, significantly increase risk, such that TRI-USA would not be able to give the necessary functional guarantees for the operation of the system with regard to functionality, availability, and reliability. However, this does not preclude supply of many of these components by TRI-USA from U.S. manufacturing facilities and/or early cooperation with selected U.S. companies in many fields, which will be described in detail later in this report. A complete description of the TRI Technology Transfer plan is included in Addendum A to this study.